DOCUMENT RESUME

ED 233 261 CG 016 838

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TITLE Predicting Wanton Assault in a General Youth Sample via the HEW Youth Development Model's Community Program Impact Scales, Age and Sex.
SPONS AGENCY Pennsylvania State Office of Children, Youth and Families, Harrisburg.
PUB DATE 8 Apr 83
NOTE 24p.; Paper presented at the Annual Meeting of the Eastern Psychological Association (54th, Philadelphia, PA, April 6-9, 1983). For related documents, see ED 225 067, ED 229 674, and ED 232 098.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Aggression; Crime; *Delinquency; *Labeling (of Persons); Multiple Regression Analysis; *Peer Influence; *Predictive Measurement; *Predictor Variables; *Violence; Youth; Youth Problems
IDENTIFIERS *Impact Scales; National Strategy for Youth Development

ABSTRACT

The former HEW National Strategy for Youth Development Model was a community-based planning and procedural tool designed to enhance positive youth development and prevent delinquency through a process of youth needs assessment, development of targeted programs, and program impact evaluation. A series of 12 Impact Scales most directly reflect the model's components in psychometric form. Acceptable reliabilities, substantial predictive validity, and consistent correlational structural validity have been found for the Impact Scales with respect to Self-Reported Delinquency (SRD). In order to determine the ability of the Impact Scales, along with age and sex, to predict wanton assault, 1,551 males and females, aged 10-19, comprising a roughly 6% systematic random sample of youth drawn from schools in one county base, completed the Impact Scales. Analyses of results showed that two variables, youth perceived negative labeling by teachers and youth perceived normative peer group pressure towards delinquency, emerged as the primary predictors of self-reported wanton assault. The analyses also showed that 71.3% of the cases were correctly classified. However, 95% of the youths predictively identified in the high wanton assault group were found to be false positives. The high level of false positives in the prediction of violent behavior highlights the ethical/legal dilemmas involved in the prediction of violence for any given individual. (WAS)

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ED233261

Predicting wanton assault in a general youth sample via the New youth development model's community program Impact Scales, age and sex

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CG 016838

A paper presented at the 54th Annual Meeting of the Eastern Psychological Association, Philadelphia, PA, April 8, 1983.

Abstract

A stepwise multiple regression analysis and a stepwise multiple discriminant function analysis of HEW community program Impact Scales, age and sex vis a vis low, mid, and high wanton assaultiveness levels was run on the self-report data of 1,551 youths, ages 10 - 19, who comprised a roughly 6% systematic school random sample. A multiple $\underline{R}$ = .43 was obtained from the regression analysis. Discriminant function analysis yielded 71.3% correct classification. In the latter analysis, 13% of the sample containing 95% false positives were predicted into the High Wanton Assaultiveness (WA) group; 98.5% of the sample containing 1% false negatives with respect to High WA were predicted into the Low-Mid WA groups. Youth perceived Negative Labeling by Teachers and Youth Perceived Normative Peer Group Pressure Towards Delinquency were by far the most predictive variables in each analysis. Practical and ethical problems entailed by High WA false positives are discussed.

EPA Convention, Philadelphia, PA, April 8, 1983

Predicting wanton assault in a general youth sample via the HEW youth development model's community program Impact Scales, age, and sex

The HEW Office of Youth Development's (OYD) National Strategy for Youth Development Model (Elliott et. al., Note 1) serves as the theoretical context for examining juvenile wanton assaultiveness in this study. The HEW model was promoted as a community-based planning and procedural tool designed to enhance positive youth development and prevent delinquency through a process of youth needs assessment, development of needs targeted programs, and program impact evaluation. The National Strategy is unique in that it is predicated on a social-psychological model of youth development and contains requisite measures of the model's components. Of the many assessment tools employed (a problems and needs section; a knowledge of agencies questionnaire; a demographic information section; and a series of Impact Scales), the Impact Scales most directly reflect the model's components in psychometric form.

The HEW behavioral model is one wherein mutually reinforcing components press toward and interact with positive youth development on the one hand, or delinquency on the other. In a positive direction, a sense of general societal belonging, youth perceived positive peer group pressure, youth perceived positive labeling by significant others, and youth perceived access to desirable social roles, are all synergistically reinforcing with positive behavior. In the negative direction, synergistic interactions press towards delinquent behavior.

Twelve Impact Scales measure these major components. The alienation component is tapped by Impact Scales Normlessness vs. Conformity, Powerlessness vs. Control, and Societal Estrangement vs. Societal Integration. Youth perceived negative labeling by others is reflected by Impact Scales: Youth Perceived Negative/Positive Labeling by Parents; by Teachers; and by Peers. Another Impact Scale, Parental Rejection might logically be grouped here. Impact Scales tapping youth perceived access to desirable social roles include: Youth Perceived Access/Lack of Access to Educational Roles; and Youth Perceived Access/Lack of Access to Occupational Roles. The three remaining Impact Scales are: Normative Peer Group Pressure towards delinquency, Self-Esteem, and Self-Reported Delinquency (SRD). Table 1 lists these scales.

Insert Table 1 about here

Acceptable reliabilities (Brennan & Huizinga, Note 2), substantial predictive validity of Impact Scales with respect to Self-Reported Delinquency (SRD) on the order of $\underline{R} \approx .70$ (Brennan & Huizinga, Note 2); and Truckenmiller, 1982), as well as consistent correlational structural validity (Brennan & Huizinga, Note 2; and Truckenmiller, 1978, 1982a, 1982b) have been found for the Impact Scales. Impact Scales may also be highly predictive of variation for individual SRD items. For example, scores on a vandalism item can be significantly predicted from Impact Scales, age, and sex (Truckenmiller, Note 3).

The SRD item pertaining to wanton assaultiveness reads as follows: "Beat up on other kids or adults just for the heck of it", endorsed "Never", "Once

or Twice", "Several Times", or "Very Often." It is this item which served as the dependent variable. Impact Scales excluding SRD served as the predictor variables. Since age and sex have been found the most SRD predictive of demographic variables used in the HEW model (Fink & Truckenmiller, Note 4), these too were included as predictor variables in the present study.

Method

Subjects

The subjects were 1,551 males and females, ages 10 to 19 years old, who comprised a roughly 6% systematic random sample of youth drawn from schools in one county base of a multi-county demonstration project.[1]

Procedure

Materials consisted of the HEW Community Program Impact Scales administered as part of the Youth Needs Survey Questionnaire package (Elliott, et. al., Note 1) given in the Pennsylvania Youth Services Systems demonstration project (Lombardo, 1977; Truckenmiller, Skok, and Lennon, 1978). Proctors were on hand to help with any difficulties. Confidentiality was maintained by use of respondent identification numbers rather than names.

First, a stepwise multiple regression analysis of the Impact Scales, age, and sex was run on the SRD item "Beat up on other kids or adults just for the heck of it", endorsed "Never", "Once or Twice", "Several Times", or "Very Often." Next, a stepwise multiple discriminant function analysis of predictor variables vis a vis the SRD wanton assaultiveness item was run. For this

analysis, the "Never" and "Once or Twice" response options were collapsed into a Low Wanton Assaultiveness category. Subjects answering "Several Times" comprised the Mid Wanton Assaultiveness group; and subjects answering "Frequently" were designated the High Wanton Assaultiveness Group. Both analyses were run using a BMDP statistical package (Dixon, 1981).

Results

Table 2 shows a summary of variables successively extracted via stepwise multiple regression along with the corresponding R, R^2, increase in R^2 at each step, and F-to-enter at each step. Table 3 shows the final regression coefficients. The variables most predictive of Self-Reported Wanton Assaultiveness (SRWA) in order of successive extraction were: Youth Perceived Negative Labeling by Teachers; Youth Perceived Normative Peer Pressure Towards Delinquency; sex (males more likely to be assaultive); Youth Perceived Parental Rejection; and Youth Perceived Access to Educational Roles (-). A multiple $R = .43$, $p \leq .0005$, 2 tail, was obtained accounting for about 18% of SRWA variance. The first two variables extracted, Youth Perceived Negative Labeling by Teachers and Normative Peer Pressure Towards Delinquency, accounted for 16% of the predictive variance with $R = .40$, $p \leq .0005$, 2 tail.

Table 4 shows the summary of the stepwise multiple discriminant function analysis. Discrimination variables are listed in order of extraction. Table 5 shows the jacknifed cross-classification of cases into Low, Mid, and High Wanton Assaultiveness groups obtained from the discriminant function analysis.

Insert Tables 2, 3, 4 and 5 about here

It can be seen from Table 5 that only three variables were extracted in the stepwise multiple discriminant function analysis: Youth Perceived Negative Labeling by Teachers; Youth Perceived Normative Peer Pressure Towards Delinquency; and Youth Perceived Parental Rejection. These variables had also been extracted in the same order via stepwise multiple regression. The first two variables, Youth Perceived Negative Labeling by Teachers, and Youth Perceived Normative Peer Group Pressure Towards Delinquency, accounted for the most substantial proportion of variance in both analyses. Variables sex, age, and Youth Perceived Access to Educational Roles did not emerge in the discriminant function analysis. These variables were also of but minor predictive significance in the stepwise multiple regression analysis.

In Table 5 showing the cross-classification of cases into Low, Mid, and High Wanton Assaultiveness groups as a function of discriminatively predictive variables, it can be seen that the vast majority of cases can be predictively classified with accuracy. Looking row-wise, it can be seen that 72.6%, 45.5%, and 41.7% of the Low, Mid and High Wanton Assaultiveness groups were correctly identified from the predictor variables. 71.3% of the cases overall were correctly placed.

Focus will now shift to a consideration of the High Wanton Assaultiveness group in terms of correct predictions, false positives, and false negatives. For this part of results presentation, the Low Wanton Assaultiveness and Mid

Wanton Assaultiveness are considered as one group. As can be seen from an examination of Table 5, one is dealing with a situation wherein one is attempting to predict rare events. Only 24 of the 1,551 youths, or .015% of the sample, comprise the High Wanton Assaultiveness group. Of these 24 youths, 10 cases, or 41.7% were correctly identified via Impact Scales. This is not to say, however, that 41.7% of those youth predicted into the High Wanton Assaultiveness group actually came from the High Wanton Assaultiveness group. Only 5% of the cases predicted into the High WA group came from the apriori High WA group. That is, 95% of the youth predictively identified as High WA were false positives. Roughly 13% of the sample (213 cases) were predicted into the High WA group. Ten of the cases actually came from the apriori High WA group. By way of contrast, there were very few false negatives, either in terms of the number or percentage of cases misclassified. Only 14 cases out of 1,338, or 1%, were wrongly classified as non-High WA.

Discussion

The stepwise multiple regression results are probably an underestimate of the predictive accuracy obtainable in accounting for SRWA variation as a function of Impact Scales, age, and sex. It is well known that restricted ranges of variance will decrease the size of correlations obtained (Guilford, 1965). In the limiting case, a variable with no variance will correlate zero with any other variable. For the dependent variable of the current regression analysis, the range is restricted to four scores. Furthermore, the distribution of dependent variable scores is extremely positively skewed, thus

further diminishing the accuracy of multiple linear prediction. As can be seen from a comparison of the stepwise multiple linear regression results (Table 3) with the stepwise multiple discriminant function analysis (Table 5), a much greater degree of predictive accuracy is obtained from the latter than from the former. This finding is also in keeping with results that might be obtained via stepwise multiple regression were the WA item expanded to match the SRD scale in terms of length and variability. When the obtained $\underline{R}$ of .43 is corrected for hypothetical expansion of SRWA, (Guilford, 1965) an $\underline{R}$ of .98 is obtained. Calculation of a hypothetical corresponding Index of Forcasting Efficiency (Guilford, 1965) yields $\underline{E}$ = 80.66% compared to the actual $\underline{E}$ = 9.59%. That is, there would be a very large reduction in errors of prediction were an SRWA scale comparable to the SRD scale to be constructed.

While the above statistical conjecture may be a rather optimistic projection, the results of the stepwise multiple discriminant function analysis (Table 4) suggest that $\underline{R}$ = .43 is clearly an underestimate of predictive accuracy obtainable when predicting Self-Reported Wanton Assaultiveness via the HEW Impact Scales, age, and sex.

Whatever predictive method is used, only two variables, Youth Perceived Negative Labeling by Teachers and Youth Perceived Normative Peer Group Pressure Towards Delinquency, seem of appreciable importance. That these two variables should emerge as the primary predictors of Self-Reported Wanton Assaultiveness (SRWA) is consistent with other findings on predicting Self-Reported Delinquency (SRD) from HEW Impact Scales, age, and sex (Truckenmiller, Note 3). In the latter study, a multiple stepwise discriminant function analysis of Impact Scales, sex, and age vis a vis Low, Mid, and High SRD groups yielded 62% overall

correct classification. Normative Peer Pressure, Normlessness, Age, Youth Perceived Negative Labeling by Teachers, by Peers and by Parents were the most discriminative variables. Parental Rejection was a minor predictor in both cases. For the High SRD group, 75.9% could be correctly classified; for the Mid SRD group, 45.7% could be correctly classified; and for the Low SRD group, 72.1% of the group could be correctly classified. False positives were fewer for High SRD classification than for SRWA classification. With respect to High SRD classification, 192 of 450 cases (42.6% false positives) came from Low and Mid SRD groups. The proportion of false negatives with respect to the High SRD group was limited to 7.4%, or 82 out of 1,104 cases. Thus, classification of youth into a high delinquency group via HEW Impact Scales and age, is more accurate than classification of these same youth with respect to wanton assaultiveness levels.

The problem of false positives in predicting violent behavior and the ethical/legal dilemmas attending the prediction of violence for any given individual have received considerable attention of late (Monahan, 1981). The prediction of criminal violence is one of the most scientifically, clinically, and legally perplexing and refractory problems of our society today (Cohen, Groth, & Seigel, 1978; Koerin, 1978; Schlesinger, 1978; and Ewing, Note 5). To this writer's thinking, even were one to argue that the protection of members of society from wanton assault by a few, deserving of justice as they are, is equally important as the protection of innocent individuals from misaccusation, the current state of predictive accuracy still weighs against the use of proxy

variables for identifying wantonly assaultive youth in the absence of other legally acceptable information. Even were there only 5% false positives, which is clearly not the case, the wrongly identified youth might bear the burden of proving innocence in general, though accused of no misdeeds in particular. There is also the further danger that misidentified youth would thereafter become increasingly subject to specific accusations, wrongly made. In regard to using HEW variables for juvenile criminal justice purposes it should be remembered that the current results were obtained under conditions of subject confidentiality. If the surveys were to be administered otherwise, predictive relationships might be altered considerably.

The value and intent of presenting current findings on the HEW model lies more in the area of setting tones and directions for preventive programmatic attempts at reducing delinquency and promoting positive youth development, and in enhancing our understanding of factors most contributing to delinquency, rather than in examining measurements for identifying particular delinquent youth. The intent of the HEW National Strategy is to promote the well being of youth, not to identify criminals.

The strongest and most consistent thread running through HEW Youth Development Model research points to the inescapable conclusion that educational programs, whatever their particular techniques, must be embedded in an atmosphere of sound, positive, caring human relationships. The same might be said of programs aimed at promoting sound family relationships, and positive peer relationships. It also seems to this writer that the particular embodiments of the above generalities may vary from group to group, place to place, and

institution to institution, and that many small scale experimental studies are needed if more refined explanations and prediction of juvenile behavior are to be forthcoming. In the end, it is probably just as one county project leader said after pouring over masses of correlational tables and ANOVA's and regression equations: "You've got to love em."

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Footnotes

This research was supported by a grant from the Crime Prevention Program for Juveniles from the Office of Children, Youth, and Families, PA Department of Public Welfare. Joseph A. Skok, PA Department of Education, was the multi-county Pennsylvania Project Director. William P. Lennon was director of the county project which provided the data for this report. James L. Truckenmiller was senior research and evaluation associate for the Pennsylvania Project and wishes to express his indebtedness to the many people too numerous to list.

This article is based on a paper presented at the Eastern Psychological Association Convention, Philadelphia, PA, April 8, 1983.

Table 1

List of HEW Community Program Impact Scales Entered into the Stepwise Multiple Regression and Discriminant Function Analyses

1. Normlessness.
2. Societal Estrangement.
3. Control vs. Powerlessness.
4. Youth Perceived Lack of Access to Educational Roles.
5. Youth Perceived Lack of Access to Occupational Roles.
6. Youth Perceived Negative Labeling by Parents.
7. Youth Perceived Negative Labeling by Teachers.
8. Youth Perceived Negative Labeling by Peers.
9. Self-esteem.
10. Normative Peer Group Pressure Towards Delinquency.
11. Parental Rejection.

Table 2

Summary of variables successively extracted via stepwise multiple regression and the corresponding multiple $\underline{R}$, $\underline{R}^2$, increase in $\underline{R}^2$, and $\underline{F}$-to-enter at each step

Step Number	Variable Entered	Removed	Multiple $\underline{R}$	$\underline{RSQ}$	Increase in $\underline{RSQ}$	F-to-Enter
1.	Labtch		.3556	.1265	.1265	224.2874
2.	Nrmppr		.3950	.1560	.0295	54.1548
3.	Sex		.4087	.1670	.0110	20.4065
4.	Age		.4183	.1750	.0080	15.0213
5.	Parrej		.4299	.1789	.039	7.2852
6.	Acced		.4273	.1826	.0037	6.9850

Table 3

Final regression coefficients for the stepwise multiple regression analysis of the HEW impact scale on self-reported wanton assault

Variable	Coefficient	Std. Error of Coeff.	Std. Reg. Coeff.	F-to-Remove
age	-.032	.008	-.093	16.20
sex	-.138	.028	-.118	24.84
Acced	.028	.011	.067	6.99
Labtch	.019	.002	.240	73.39
Nrmppr	.028	.004	.181	45.56
Parrej	.016	.005	.075	9.11

(Y-intercept = .780)

Table 4

Summary Table for the Stepwise Multiple Discriminant Function Analysis of HEW Community Program Impact Scales, Age, and Sex vis a vis Self-Reported Wanton Assaultiveness Levels

Step Number	Variable Entered	*F* Value to Enter	Number of Variables	Approximate *F* - Statistic	Degrees of Freedom	
1	LabTch	48.0126	1	48.012	2.00	1548.00
2	Nrmppr	8.0367	2	27.760	4.00	3094.00
3	Parrej	5.7385	3	20.473	6.00	3092.00

Note: LabTch = Youth Perceived Negative Labeling by Teachers; Nrmppr = Youth Perceived Peer Pressure Towards Delinquency; Parrej = Youth Perceived Parental Rejection.

No. 21

Table 5

Classification of Cases into Low, Medium, and High Level Wanton Assaultiveness Groups from HEW Community Program Impact Scales, Age, and Sex via Multiple Stepwise Discriminant Function Analysis

Apriori Group	Percent Correct	Predicted (aposteriori) Group			Total Cases
		Low WA	Mid WA	High WA	
Low WA	72.6%	1077	218	188	1483
Mid WA	43.2%	10	19	15	44
High WA	41.7%	6	8	10	24
Totals	71.4%	1093	245	213	1551
Aposteriori Percent Correct	71.4%	98.5%	7.8%	4.7%	

Note: WA = Self-Reported Wanton Assaultiveness Level